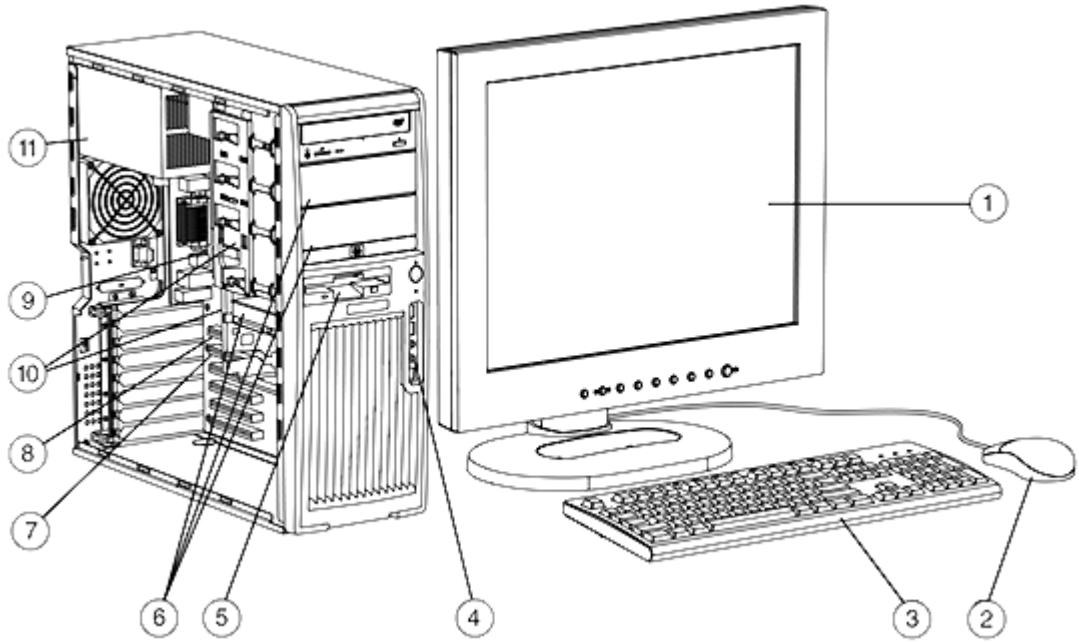
Overview

HP recommends Windows Vista® Business



1. Monitor (sold separately)
2. 2-Button Scroll Mouse
3. Standard Keyboard
4. Front IO: 2 USB 2.0, IEEE-1394 (requires optional PCI card to enable), headphone and microphone
5. One 3.5" external bay for optional diskette drive or other 3.5" device
6. Three 5.25" external bays (3rd external is not full depth), and two 3.5" internal bays
7. 2 USB 2.0 internal ports
8. 2 PCI slots, 1 PCI Express x4 slot, (with x1 functionality), 1 PCI Express x16 slot
9. AMD Opteron 1000-series processors
10. Rear IO: 6 USB 2.0, 1 standard serial port, 1 optional serial port, RJ-45, audio line in, audio line out, and microphone in DVI-D, VGA.
11. 300 watt (continuous) 80 PLUS efficient power supply

At A Glance

- Choice of Operating Systems:
  - Microsoft Vista® Business 32 or 64 (64-Bit expected availability CQ1 2008)*
  - Microsoft Windows XP Professional (32-Bit)
  - HP Linux Installer Kit (see http://www.hp.com/workstations/software/linux)
    Red Flag Linux v5 preload**
    For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_matrix
- Designed to meet the needs of customers, across all market segments, looking for a stable solution to cover mainstream business needs.
- Created using industry leading Design for Environment standards. Upgradeable, recyclable and energy efficient.
- AMD 690G Chipset
- AMD Opteron™ Processor 1000 series with HyperTransport™ technology
- Dual-Core processing
- AMD64 Technology
  - Direct Connect Architecture
  - 1 GHz AMD HyperTransport™ Bus
  - 128KB L1 cache per core (64KB instruction and 64KB data)

Overview

  - 2 MB L2 cache (1 MB per core)
  - MMX, SSE,SSE2, SSE3, 3DNOW Pro multimedia instructions
- Support for AMD Power Now™ technologies
- Integrated professional graphics featuring 1 DVI-D + 1 VGA graphics ports
- Dual monitor support standard
- RAID 0/1 support
- Embedded TPM1.2 compliant security module (Vista Bit-Locker ready)
- Support for 3.0 Gb/s Serial ATA hard drives
- Value-added software available pre-installed:
  - HP OpenView and Altiris manageability software agents
  - Symantec Antivirus 10.0 with 60 day Live Update Subscription
  - HP Backup and Recovery Manager
- HP BIOS for security, manageability and software image stability
- Integrated HP Gigabit LAN by Broadcom
- Convertible and tool-less minitower chassis
- 2 PCI Express slots/2 PCI slots
- Dual channel Unbuffered DDR2 memory at 667 MHz
- Four channel SATA Controller with RAID*** (Factory integrated RAID is Microsoft Windows only)
- Realtek ALC262 integrated high definition audio with internal speaker
- Pre-loaded Manageability tools (Microsoft Windows only)
- 1-year parts, 1-year labor and 1-year on-site warranty services available on some SKUs (terms and conditions vary by country; certain restrictions and exclusions apply)
- 3-years parts, 3-years labor and 3-years on-site warranty services available on some SKUs (terms and conditions vary by country; certain restrictions and exclusions apply)
- HP Insight Diagnostics software

* Not all Windows Vista features are available for use on all Windows Vista Capable PCs. All Windows Vista Capable PCs will run the core experiences of Windows Vista, such as innovations in organizing and finding information, security, and reliability. Some features available in premium editions of Windows Vista -- like the new Windows Aero™ user interface -- require advanced or additional hardware. Check http://www.windowsvista.com/getready for details.
** Red Flag Linux available in China only
*** Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent, functionality and performance. It is a good alternative to hardware-based RAID. Please visit http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.

Standard Features - Custom Components

Processor and Speed – One of the following

Dual-Core AMD Opteron Processor 1000 series with 1 GHz HyperTransport™ Technology bus, 1 MB L2 cache per core

AMD Opteron Processor Model 1212/ 2.00 GHz
AMD Opteron Processor Model 1214/ 2.20 GHz
AMD Opteron Processor Model 1216/ 2.40 GHz
AMD Opteron Processor Model 1218/ 2.60 GHz
AMD Opteron Processor Model 1220/ 2.80 GHz
AMD Opteron Processor Model 1222/ 3.00 GHz

NOTE: Dual Core is a new technology designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefit; check with software provider to determine suitability. Not all customers or software applications will necessarily benefit from use of this technology.

Operating System – One of the following

Microsoft Vista® Business 32 or 64 (64-Bit expected availability in CQ1 2008)

Genuine Windows XP Professional SP2 (32-Bit)

Red Flag Linux v5 preload (China Only)

HP Linux Installer Kit (see http://www.hp.com/workstations/software/linux): (expected availability CQ1 2008)

Red Hat Enterprise Linux WS4 (Update 6 or later – 32- & 64-bit version)
Red Hat Enterprise Linux 5 Desktop (Update 1 or later – 32 & 64 bit version)
For detailed OS/hardware support information for Linux, see:
http://www.hp.com/support/linux_hardware_matrix

1-2 Hard Disk Drives – Up to 2 of the following SATA drives

	Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
SATA Hard Drives			
80 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
160 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
250 GB 7200 rpm SATA 3.0Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
500 GB 7200 rpm SATA 3.0Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop

i Support for all peripherals and parts on Microsoft Windows Vista Business 64 is subject to the expected availability of Microsoft Vista Business 64 in CQ1 2008

Standard Features - Custom Components

		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
Factory Integrated RAID (on motherboard for SATA drives. All drives must be identical in type and capacity)	RAID 0 Configuration – Striped Array (SATA or SAS)	32-Bit, 64-Bit	32-Bit	Not supported
	RAID 1 Configuration – Mirrored Array (SATA or SAS, 2 drive max.)	32-Bit, 64-Bit	32-Bit	Not supported

NOTE: Requires identical hard drives (speeds, capacity, interface). (HW RAID functionality not supported by Linux)

		Windows Vista	Windows XP	Red Hat Linux
Memory – One of the following	**PC2-5300E ECC Unbuffered RAM DIMMs**			
	HP 1 GB (2 x 512 MB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	HP 2 GB (2 x 1 GB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	HP 3 GB (2 x 512 + 2 x 1 GB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	HP 4 GB (4 x 1 GB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	PC2-5300 Unbuffered RAM DIMMs			
	HP 512 MB (2 x 256 MB) PC2-5300E DDR2-667 ECC	32-Bit	32-Bit	WS 4 & 5 Desktop
	HP 1 GB (2 x 512 MB) PC2-5300E DDR2-667 ECC (expected availability in CQ4 2007)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	HP 2 GB (4 x 512 MB) PC2-5300E DDR2-667 ECC (expected availability in CQ4 2007)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop

NOTE: Do not mix ECC and non-ECC memory. Only unbuffered DDR2 DIMMs are supported. All DIMMs must be either x8 or x16 width.

Removable Storage		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	FDD Floppy drive			
	1.44 MB Diskette Drive (1 only)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Optical drives			
	SATA 16X DVD-ROM*	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	SATA 16X DVD+/-RW, Supermulti with Lightscribe**	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop

NOTE: * Not supported as a 2nd drive option.
** LightScribe creates a grayscale image similar to black and white photography. LightScribe media required and sold separately. Double-layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

Input Devices		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	Keyboard – One of the following			
	USB Standard Keyboard	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Mouse – One of the following			
	USB 2-Button Scroll Mouse (optical)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	USB 3-Button Mouse (optical)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop

Audio		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	Integrated High Definition Realtek ALC262 audio with internal speaker	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Sound Blaster X-Fi XtremeMusic Audio Card	32-Bit, 64-Bit	32-Bit	Not Supported

NIC (Network Interface Controller)		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	Integrated PCIe Broadcom 5755 Netxtreme Gigabit Ethernet NIC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop

PCI Express Graphics		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	Integrated Graphics			
	Integrated ATI Radeon X1250 graphics	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Professional 2D			
	NVIDIA Quadro NVS 290 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Entry 3D			
	NVIDIA Quadro FX 370 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	NVIDIA Quadro FX 570 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Mid-range 3D			
	NVIDIA Quadro FX 1700 PCIe (512 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	ATI FireGL V5600 PCIe (512 MB)	32-Bit, 64-Bit	32-Bit	Not supported

Standard Features - Custom Components

Miscellaneous		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux
	Solenoid lock and hood sensor	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop
	Configure minitower in desktop orientation	N/A	N/A	N/A
	HP IEEE 1394a 3-Port PCI Card	32-Bit, 64-Bit	32-Bit	Not Supported

Software		Windows Vista[i]	Windows XP	Red Hat Linux
	OS options			
	Microsoft Windows Vista® Business 64	64-Bit (when available)	Not supported	Not supported
	OR Microsoft Windows Vista® Business 32	32-Bit	Not supported	Not supported
	OR Microsoft Windows XP Professional SP2	Not supported	32-Bit	Not supported
	OR Red Hat Enterprise Linux WS 4 & 5 Desktop (32 & 64-bit)	Not supported	Not supported	WS 4 & 5 Desktop
	OR Red Flag Linux v5 (China Only)	Not supported	Not supported	Not supported
	OR HP Red Hat Linux Installer Kit (includes drivers for both 32-bit & 64-bit)	Not supported	Not supported	WS 4 & 5 Desktop
	Standard			
	Alert Standard Format specification	32-Bit, 64-Bit	32-Bit	Not supported
	HP Performance Tuning Framework	32-Bit, 64-Bit	32-Bit	Not supported
	HP Client Manager Software v6.2 (optional download)	32-Bit, 64-Bit	32-Bit	Not supported
	Intervideo WinDVD with DVD player	32-Bit, 64-Bit	32-Bit	
	HP Backup and Recovery	32-Bit, 64-Bit	32-Bit	Not supported
	PDF Complete	32-Bit, 64-Bit	32-Bit	Not supported
	Optional			
	Microsoft Office 2007 Small Business Edition	32-Bit	32-Bit	Not supported
	Microsoft Office 2007 Trial Edition	32-Bit	32-Bit	Not supported
	HP Client Manager Software v6.2 (optional download)	32-Bit, 64-Bit	32-Bit	Not supported
	HP ProtectTools Security	32-Bit, 64-Bit	32-Bit	Not supported
	Symantec AntiVirus 10	32-Bit, 64-Bit	32-Bit	Not supported

Standard Features - Specs

Form Factor	Minitower	
Color	Carbonite/Alloy metallic	
Convertibility	Yes. 5.25" drives rotate for Minitower or Desktop orientation.	
Expansion Slots (see system board section for more details)	• 2 PCI slots (full-height, full-length) • 1 PCI Express x4 slot (x1 functionality) • 1 PCI Express x16 slot for graphics	
Expansion Bays (see storage section for more details)	• 2 internal 3.5" bays • 1 external 3.5" bay, 3 external 5.25" bays* NOTE: Third external 5.25" bay is not full depth in side orientation.	
Front I/O	2 USB 2.0, 1 IEEE 1394 (requires optional PCI card to function), 1 headphone out, and 1 microphone. NOTE: Although HP Personal Workstations can be ordered with the HP Installer Kit for Linux and an IEEE 1394 card, HP cannot provide customer support for this configuration. Please refer to the Linux Hardware Support Matrix (http://www.hp.com/support/linux_hardware_matrix) for details, and to the Linux User Manual (http://www.hp.com/support/linux_user_manual) for tips on user-enablement of the IEEE 1394 Card.	
Internal I/O	2 USB 2.0 headers, (requires optional HP Internal USB Port Kit and is compatible with Multimedia Card Reader Option), 1 Serial Port Header (requires optional AMO), 4 SATA Ports.	
Rear I/O	6 USB 2.0, 1 serial, 1 optional serial port, RJ-45 (NIC), 1 audio line in, 1 audio line out; audio ports can be retasked to function as line in, line out, microphone, or headphone.	
Interfaces Supported	1 SATA 3 Gb/s interface (4 internal SATA connectors)	
Hard Drive Controller (PCI) **Supported**	On-board only	
On-board RAID Support	Yes	
Chassis Dimensions (W x D x H)	17.7 x 6.6 x 17.9 inches; 45.0 x 16.8 x 45.6 cm 6.6 x 17.7 x 17.9 inches; 16.8 x 45.0 x 45.6 cm	
Weight	Exact weights depend upon configuration Minimum: 29.3 lbs (13.3 kg) Standard: 32.8 lbs (14.9 kg) Maximum: 38.2 lbs (17.3 kg)	
Temperature	Operating	40° to 95°F (5° to 35°C)
	Non-operating	-40° to 140°F (-40° to 60°C)
Humidity	Operating	8% to 85%
	Non-operating	8% to 90%
Maximum Altitude (non-pressurized)	Operating	10,000 feet; 3,000 m
	Non-operating	30,000 feet; 9,100 m
Power Supply	300 watts wide-ranging, active Power Factor Correction, 80 PLUS Efficient	

Standard Features - Preconfigured Regional Models

xw4550T/PH2.6/F160/ U2.0/FX370z/p RB419UA#ABA	OS	Genuine Microsoft Windows Vista32B Downgrade to XP32B OS
	Chassis	HP xw4550 80+ Energy Efficient Chassis
	Base unit	HP xw4550 Workstation
	Localization kit	HP xw4550 Workstation Localization Kit
	Software	Microsoft Office 2007 Trial Software
	Processor	AMD Opteron 1216 2.4 1MB CPU
	Memory	HP 2GB (2x1GB) DDR2-667 ECC RAM
	Hard Drive	HP 160GB SATA 3Gb/s NCQ 7200 1st HDD
	Optical Drive	HP 16X DVD+-RW SuperMulti SATA 1st Drive
	Graphics	NVIDIA Quadro FX370 256MB PCIe Graphics
	Floppy disk drive	HP No Floppy Disk Option
	Keyboard	HP USB Standard Keyboard
	Mouse	HP USB Optical Scroll Mouse

xw4550T/PH2.6/F160/ U2.0/FX570z/p RB420UA#ABA	OS	Genuine Microsoft Windows Vista32B Downgrade to XP32B OS
	Chassis	HP xw4550 80+ Energy Efficient Chassis
	Base unit	HP xw4550 Workstation
	Localization kit	HP xw4550 Workstation Localization Kit
	Software	Microsoft Office 2007 Trial Software
	Processor	AMD Opteron 1218 2.6 1MB CPU
	Memory	HP 2GB (2x1GB) DDR2-667 ECC RAM
	Hard Drive	HP 160GB SATA 3Gb/s NCQ 7200 1st HDD
	Optical Drive	HP 16X DVD+-RW SuperMulti SATA 1st Drive
	Graphics	NVIDIA Quadro FX570 256MB PCIe Graphics
	Floppy disk drive	HP No Floppy Disk Option
	Keyboard	HP USB Standard Keyboard
	Mouse	HP USB Optical Scroll Mouse

Standard Features - Preconfigured Regional Models

xw4550T/PH2.8/F250/U2.0/FX17z/p RB421UA#ABA	OS	Genuine Microsoft Windows Vista32B Downgrade to XP32B OS
	Chassis	HP xw4550 80+ Energy Efficient Chassis
	Base unit	HP xw4550 Workstation
	Localization kit	HP xw4550 Workstation Localization Kit
	Software	Microsoft Office 2007 Trial Software
	Processor	AMD Opteron 1220 2.8 1MB CPU
	Memory	HP 4GB (4x1GB) DDR2-667 ECC RAM
	Hard Drive	HP 250GB SATA 3Gb/s NCQ 7200 1st HDD
	Optical Drive	HP 16X DVD+-RW SuperMulti SATA 1st Drive
	Graphics	NVIDIA Quadro FX1700 512MB PCIe Graphics
	Floppy disk drive	HP No Floppy Disk Option
	Keyboard	HP USB Standard Keyboard
	Mouse	HP USB Optical Scroll Mouse

After-Market Options

PCI-Express Graphics	Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
Professional 2D Multi Display Solutions				
NVIDIA Quadro NVS 290 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	GN502AA
Entry 3D				
NVIDIA Quadro FX 370 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	GP528AA
NVIDIA Quadro FX 570 PCIe (256 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	GR521AA
Mid-range 3D				
NVIDIA Quadro FX 1700 PCIe (512 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	GP529AA
ATI FireGL V5600 PCIe (512 MB)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	GT346AA

Hard Drives	Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
SATA Hard Drives				
HP 80 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PY276AA
HP 160 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PV944A
HP 250 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	EA788AA
HP 500 GB 7200 rpm SATA 3.0 Gb/s NCQ	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PV943A

Removable storage devices	Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
1.44 MB Internal Floppy Drive	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	DY670A
HP 16-In-1 Media Card Reader with PCI Card	32-Bit, 64-Bit	32-Bit	Not supported	EM718AA

After-Market Options

Input Devices		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
	Keyboards				
	HP USB Standard Keyboard	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	DT528A
	HP USB Smart Card Keyboard (Carbonite/Silver)	32-Bit, 64-Bit	32-Bit	Not Supported	ED707AA
	Pointing Devices				
	HP USB 2-Button Scroll Mouse (optical)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	DC172B
	HP USB 3-button mouse (optical)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	DY651A
	HP USB SpacePilot USB 3D Input Device	32-Bit, 64-Bit	32-Bit	Not Supported	EF390AA
	HP SpaceExplorer USB 3D Input Device	32-Bit, 64-Bit	32-Bit	Not Supported	RY429AAA

Networking		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
	NICs				
	Broadcom NetXtreme Gigabit Ethernet PCIe Adapter	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	EA833AA

Memory (Unbuffered DIMMs)		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
Configurations less than 1 GB are not supported on Microsoft Vista 64	**PC2-5300 DDR2-667 DIMMs (ECC Unbuffered)**				
	512 MB (1 x 512 MB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PV940A
	1 GB (1 x 1 GB) PC2-5300E DDR2-667 ECC	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PV941A
	PC2-5300 DDR2-667 Memory (non-ECC Unbuffered)				
	256 MB (1 x 256 MB) PC2-5300 DDR2-667	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PX974AA
	512 MB (1 x 512 MB) PC2-5300 DDR2-667 (availability CQ4 2007)	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	PX975AA

After-Market Options

Monitors	TFTs	Part Number
	HP LP3065 24-inch Flat Panel Monitor TFT	EZ320A4
	HP LP2465 24-inch Flat Panel Monitor TFT	EF224A4
	HP L2065 20.1-inch Flat Panel Monitor TFT	EF227A4
	HP L1965 19.1-inch Flat Panel Monitor TFT	RA373AA

Multimedia		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
	Adaptec Fireconnect 2100 Firewire (1394a) PCI Card (Windows only)	32-Bit, 64-Bit	32-Bit	Not supported	PA997A

* Although HP Personal Workstations can be ordered with the HP Installer Kit for Linux and an IEEE 1394a card, HP cannot provide customer support for this configuration. Please refer to the Linux Hardware Support Matrix (http://www.hp.com/support/linux_hardware_matrix) for details, and to the Linux User Manual (http://www.hp.com/support/linux_user_manual) for tips on user-enablement of the IEEE 1394a Card.

Audio		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
	SoundBlaster X-Fi XtremeGamer Audio Card (Windows only)	32-Bit, 64-Bit	32-Bit	Not supported	GE257AA

Removable Storage		Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
	FDD Floppy drive				
	1.44 MB Diskette Drive (1 only)	32-Bit, 64-Bit	32-Bit, 64-Bit	WS 4 & 5 Desktop	DY670A
	Optical drives				
	SATA 16X DVD-ROM*	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	EW268AA
	SATA 16X DVD+/-RW, Supermulti with Lightscribe**	32-Bit, 64-Bit	32-Bit	WS 4 & 5 Desktop	EW269AA

* Cannot be 2nd drive.
** LightScribe creates a grayscale image similar to black and white photography. LightScribe media required and sold separately. Double-layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players. LightScribe software works with Microsoft Windows XP and Vista only.)

Security		Part Number
	HP Solenoid Hood Lock/Sensor Kit	DE618A
	Kensington Security Cable & Lock	PC766A

After-Market Options

Racking Options	Part Number
HP xw4000 Depth Adjustable Fixed Rail Rack Kit	EK729AA

Other Devices	Part Number
Agere 2006 PCI hi-speed modem (32- and 64-Bit)	EK694AA
Modem RJ11 Adapter Kit	DC131C
2nd serial port adapter	PA716A
Front Card Guide and Fan Guide Kit	DY648A
HP Power Cord Kit	DM293A
HP Internal USB Port Kit	EM165AA

Software	Windows Vista[i]	Windows XP	Red Hat Enterprise Linux	Part Number
HP RGS PC 3-year Software Assurance	TBD	TBD	TBD	GN039AA
HP RGS V5 PC Edition	TBD	TBD	TBD	GN038AA
HP RGS V5 Receiver Site License	TBD	TBD	TBD	GN034AA
HP RGS V5 Workstation Edition	TBD	TBD	TBD	GN035AA
HP RGS Workstation 3-year Software Assurance	TBD	TBD	NTBD	GN036AA

PC2-5300E DDR2-667 ECC unbuffered DIMMs or PC2-5300 DDR2-667 non-ECC DIMMS

Only unbuffered DDR2 DIMMs (ECC unbuffered or non-ECC) are supported and must be x8 or x16 width. Memory upgrades are accomplished by adding DIMMs of the same or varied sizes.

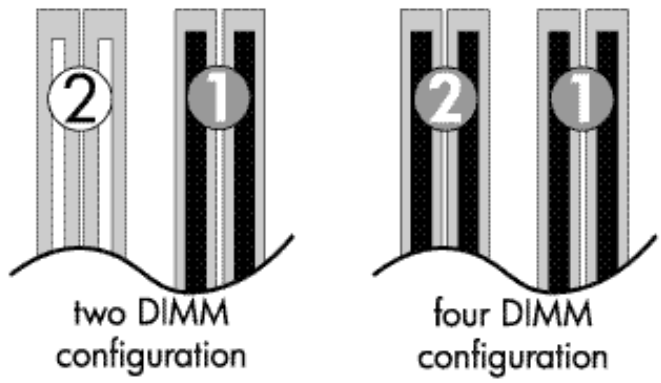
ECC/Chipkill parameters

Chipkill on the HP xw4550 functions within these parameters:

- The workstation enables Chipkill functionality on paired ECC memory DIMMs only. When a single ECC DIMM is loaded, standard single bit correct and two bit detect ECC is supported.
- Chipkill can detect and correct up to four bit errors if the four bits are in the same symbol. That is, multiple bit errors in bits 0–3 or 4–7 of a byte can be detected and corrected. Multi-bit error that overlap or span symbol boundaries (bits 2–5 or 3–6, for example) cannot be corrected. For DIMMs that are based on x4 parts, this means that a single DRAM chip can fail and the system will continue to operate. For x8 and x16 parts, a complete DRAM chip cannot fail, but symbol errors will be corrected as described. Memory Scrubbing – xw4550 supports Sequential plus Source Correction Scrubbing
  - Sequential Scrubbing
    In this mode, the scrubber sequentially proceeds through main memory, performing a read-write cycle or a read-modify-write cycle if a correctable error is found. The scrubber scrubs one cache line on each scrub interval that is programmable from 40 ns to 84 ms.
  - Source Correction Scrubbing
    In this mode, the scrubber is directed to scrub any cache line that is the source of any corrected error during normal accesses. During normal operation when source correction scrubbing is disabled, single-bit errors are corrected on the fly and the corrected data is passed without updating the source memory location. When source scrubbing is enabled the scrubber also corrects the source memory location.
  - Sequential Plus Source Correction Scrubbing
    When both sequential and source correction scrubbing are enabled, the scrubber sequentially proceeds through main memory. If a correctable error is detected during normal operation, the scrubber is redirected to the location of the error, and after it corrects that location in main memory it resumes sequential scrubbing at the previous location

Memory configuration suggestions

For best performance the total amount and type of memory loaded into Channel 1 and Channel 2 should be the same and should be loaded in pairs (two 512 MB DIMMs will have better performance than a single 1 GB DIMM). Match pairs by size and type. If these guidelines are not followed, your computer may not see all the RAM installed and may run the memory controller in a lower performance mode.



Memory

MAXIMUM MEMORY

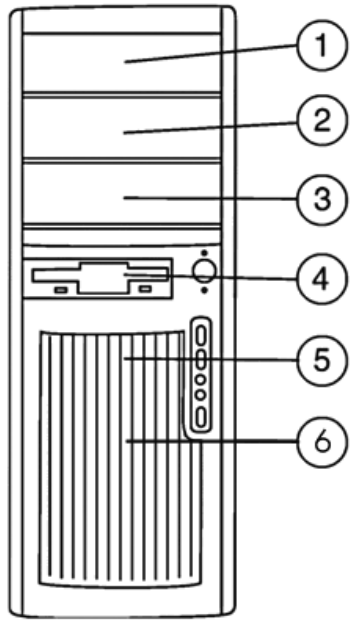
Supports up to 4 GB DDR2-667 ECC Unbuffered or 2 GB DDR2-667 non-ECC SDRAM

POSSIBLE MEMORY CONFIGURATIONS

Not all memory configurations possible are represented below.

DIMM Size	Slot 2		Slot 1	
	A	B	A	B
1 GB			512 MB	512 MB
2 GB			1 GB	1 GB
2 GB	512 MB	512 MB	512 MB	512 MB
4 GB	1 GB	1GB	1 GB	1GB

Tower configuration



	Quantity Supported	Position Supported	Controller
Convertible Minitower			
Optional Diskette Drive	1	4	Diskette
Optical Disk Drives	2	1, 2	SATA
Hard Disk Drives	2	5, 6	SATA User configurable SATA RAID 0, 1, standard

* Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent, functionality and performance. It is a good alternative to hardware-based RAID. Please visit http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.

System Board	
Processor Socket	Single AM2 socket
CPU Bus Speed Supported	1 GHz HyperTransport
Chipset	ATI RS690 (AMD690G) with the AMD SB600 south bridge
Super I/O Controller	SMSC SIO8
System Board Form Factor	ATX 9.6 x11.52 inches; 243.84 x 292.61 mm
Memory Expansion Slots	4 DIMMs DDR2-667 unbuffered ECC/non-ECC
Memory Type Supported	1.8V unbuffered DDR2-667with optional ECC (See Memory section for additional details)
Memory Modes	Dual channel
PCI Express Connectors (v1.1)	1 PCIe x16 75W 1 PCIe x4 (x1 functionality)
PCI Connectors (5.0V)	2 full length 5v 33 MHz 32-Bit
Interfaces Supported	1 SATA 3.0 Gb/s interface (4 SATA connectors); 1 floppy disk interface
Hard Drive Controller (PCI) Supported	SATA 3.0 Gb/s AHCI Controller • Supports four SATA ports, complying with SATA 3.0 Gb/s specifications • Supports SATA 3.0 Gb/s 3.0GHz PHY, with backward compatibility with 1.5 GHz
Integrated SATA RAID	• Supports RAID striping (RAID 0) across all 4 ports (only 2 drive RAID 0) • Supports RAID mirroring (RAID 1) across all 4 ports (only 2 drive RAID 1) • Supports both AHCI mode and IDE mode • Supports advanced power management with AHCI mode • AHCI support for NCQ drives • 3.0 Gb/s drive support NOTE: Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.
Integrated Graphics	ATI Radeon X1250 based graphics engine: • UMA architecture (gfx frame buffer). Unified Memory Architecture - A region of system memory is reserved and dedicated to the graphics display. • DirectX 9.0 compliant • 2D/3D graphics core • 1 DVI-D + 1 VGA graphics ports integrated in motherboard • integrated graphics can do dual display across VGA & DVI-D (See Technical Specifications – Graphics section for additional details)
Network Controller	Integrated Broadcom 5755 Gigabit Ethernet LAN-on-Motherboard (See Technical Specifications – Networking section for additional details)
IEEE 1394a Connectors	Not natively supported but can be added optional PCI 1394A controller card (HPPN 354614-006) to supply 3 standard 1394a ports (1 front panel and 2 rear chassis).

Technical Specifications

USB 2.0 Connectors	Front: 2 Rear: 6 Internal:2 (headers compatible with optional kit providing internal header to real USB connector and compatible with multimedia card reader cable)
HD Integrated Audio	Integrated high definition digital audio processing with Realtek 2 channel ALC262 codec (all ports are stereo). It features universal Audio Architecture: • 1 stereo DAC supports 16/20/24-bit PCM format with 44.1K/48K/96K/192kHz sample rate • 2 stereo ADCs support 16/20-bit PCM format with 44.1K/48K/96kHz sample rate • Rear panel line in and line out jacks – jacks are retaskable • Front panel microphone in and headphone out – fixed usage. (See Technical Specifications – Networking section for additional details)
Flash ROM	Yes
Clear CMOS Button	Yes
CPU Fan Header	Yes
Chassis Fan Header	Yes
Front PCI Fan Header	Yes – optional
Front Control Panel/Speaker Header	Yes
CMOS Battery Holder - Lithium	Yes
Multibay Header	No
Integrated Trusted Platform Module	TPM 1.2
ASF 2.0 (Alert Standard Format)	Yes
Power Supply Headers	Yes
Power Switch, Power LED & Hard Drive LED Header	Yes
Clear Password Jumper	Yes
Serial ports	One integrated port, one external port via add on kit
Keyboard/Mouse	USB keyboard/mouse only (no PS2 support)
Parallel Port	No

Cooling	
Chassis Fan	92 mm x 92 mm x 25 mm 4-wire high frequency PWM
Processor Heatsink Fan	80 mm x 80 mm x 15 mm 4-wire high frequency PWM
(Optional) Front PCI Fan	92 mm x 92 mm x 25 mm 4-wire high frequency PWM
Power Supply Fan	80 mm x 80 mm x 25 mm variable speed

Technical Specifications

Power Supply	300-watt 80 PLUS BTX power supply – Active PFC
Operating Voltage Range	90 – 264VAC
Rated Voltage Range	100 – 240VAC
Rated Line Frequency	50/60 Hz
Operating Line Frequency Range	47–63 Hz
Rated Input Current	5 A @ 100–120 VAC 2.5A @ 200–240 VAC
Heat Dissipation	Typical 431 btu/hr (108 kg-cal/hr)
	Maximum 1331 btu/hr (336 kg-cal/hr)
Power Supply Fan	80x25 mm variable speed
Energy Star 3.0 Compliant	Yes
Energy Star 4.0 Compliant	Yes
FEMP Standby Power Compliant (<2W in S5 – Power Off)	Yes
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	<3W
Environmental and Mechanical Engineering Support Center (EMESC) – Intranet Web Site only	http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm

BIOS Features	
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces
ASF 2.0 Compliant	Allows workstation status to be monitored on a remote console and remotely powered on or off
WMI Support	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications
BIOS Boot Spec 1.01+	Provides more control over how and from what devices the workstation will boot
Users can define a specific date and time for the system to power on	Allows for very low power consumption with quick resume time
ROM Based Computer Setup Utility (F10)	Review and customize system configuration settings controlled by the BIOS
Remote System Installation via F12 (PXE) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS
Serial, USB, Audio, Network, Enable/Disable Port Control	Enable or disables serial, parallel, USB, audio, and network ports

Technical Specifications

Removable Media Write Control/ Boot Control	User can prevent the workstation from writing to or booting from removable media
Power-On Password	Prevents an unauthorized person from booting up the computer
Setup Password	Prevents an unauthorized person from changing the system configuration
Replicated Setup	Saves BIOS settings to diskette or USB flash device in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering Computer Setup Utility (F10)
Memory Change Alert (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed
Thermal Alert (Requires HP Client Manager Software)	Monitors the temperature state within the chassis. Three modes: • NORMAL – normal temperature ranges • ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown • SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup	• System administrators can power on, restart, and power off a client computer from a remote location.
ACPI (Advanced Configuration and Power Management Interface)	• Allows the system to enter and resume from low power modes (sleep states) • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system • Supports ACPI 2.0 for full compatibility with 64-bit operating systems
SMBIOS	System Management BIOS 2.4, previously known as DMI BIOS, for system management information
ROM revision levels	Identifies system ROM revision levels and reports in Computer Setup Utility (F10). Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information
System board revision level	• Allows management SW to read revision level of the system board • Revision level is digitally encoded into the HW and cannot be modified
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup/ Remote Shutdown	• System administrators can power on, restart, and power off a client computer from a remote location. • Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.
ROM Based Setup (F10) and Start-up Diagnostics	Yes

Technical Specifications

Industry Standard	Revision Supported by the BIOS
ACPI	Advanced Configuration and Power Management Interface, Version 2.0
ASF	Alert Standard Format Specification, Version 2.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0
BBS	BIOS Boot Specification v1.01
BIOS 32-bit Services	Standard BIOS 32-bit Service Directory Proposal
CD Boot	"El Torrito" Bootable CD-ROM Format Specification Version 1.0
EDD	• Enhanced Disk Drive Specification Version 1.1 • BIOS Enhanced Disk Drive Specification Version 3.0
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
PCI	• PCI Local Bus Specification, Revision 2.3 • PCI Power Management Specification, Revision 1.1 • PCI Firmware Specification, Revision 3.0, Draft .7
PCI Express	PCI Express Base Specification, Revision 1.1
PMM	POST Memory Manager Specification, Version 1.01
SATA	• Serial ATA Specification, Revision 1.0a • Serial ATA 3 Gb/s: Extensions to Serial ATA 1.5 Gb/s, Revision 1.0
SMBIOS	System Management BIOS Reference Specification, Version 2.4
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 1.2
UHCI	Universal Host Controller Interface Design Guide, Revision 1.1
USB 1.1	Universal Serial Bus Revision 1.1 Specification
USB 2.0	Universal Serial Bus Revision 2.0 Specification

System Software Updating	
Product Change Notification	• Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile. • PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition. • Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup/ Remote Shutdown	• System administrators can power on, restart, and power off a client computer from a remote location. • Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.
ROM Based Setup (F10) and Start-up Diagnostics	Yes
Support Software CD & WWW	Yes

Other deployment & management features	
HP Client Management Solutions	Visit http://www.hp.com/go/easydeploy

Technical Specifications

Security Features	
Padlock support	Padlock loop in rear of chassis. Locks side cover and secures chassis from theft. (0.22" diameter)
Cable Lock Support	Kensington lock slot in rear of chassis. Locks side cover and secures chassis from theft. (3mm x 7mm opening)
Universal chassis clamp lock support	Threaded feature in rear of chassis. Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple units to be chained together when used with optional cable.
Solenoid lock and hood sensor	Yes
Rear Port Control Cover (optional)	Locks rear IO cables to prevent cable theft.
Serial, USB Enable/Disable	Enable or disable serial or USB ports and hide them form the operating system
Removable Media Write/ Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)
Power-On Password	Prevents an unauthorized person from booting up the computer
Setup Password	Prevents an unauthorized person from changing the system configuration

Other Features	
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI). • Allows the system to wake from a low power mode. • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system

Serviceability Features of System	
Access Panel	Tool-less
Optical Drives	Tool-less
Floppy Drive	Tool-less
Hard Drives	Tool-less
Expansion Cards	Tool-less
Green user touch points	Yes, on tool-free internal chassis mechanisms
Color-coordinated cables and connectors	Yes
Memory	Tool-less, can be upgraded without removing any internal components
System Board	Tool-less removal
Dual Color Power and HD LED on Front of Computer (Indicates Normal Operations and Fault Conditions)	green – normal red – fault
Configuration Record SW	Yes
3.3V Aux Power LED on System PCA	Yes
CMOS Battery Holder for easy Replacement	Yes
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status

Dual Function Front Power Switch	Also acts as a reset switch when held for 4 seconds

Service and Support	On-site Warranty and Service (Note 1): One and three-years, limited warranty and service offering delivers on-site, next business-day (Note 2) service for parts and labor and includes free telephone support (Note 3) 8am - 5pm. Global coverage (Note 2) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering
	Note 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.
	Note 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.
	Note 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

Eco-Label Certifications & Declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • US ENERGY STAR 4.0 (Windows only, available on selected configurations) • US Federal Energy Management Program (FEMP) • China Energy Conservation Program • IT ECO declaration • Japan PC Green label* *NOTE: This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

Energy Consumption and Noise Emissions		
Example Configuration #1	Processor Info	1x AMD Opteron 3.0GHz 1222
	Memory Info	4x1GB DDR2-667MHz
	Graphics Info	FX1700
	Disks/Optical/Floppy	1x250GB SATA / 1 Optical / 1 Floppy

Technical Specifications

Energy Consumption

	115 VAC		230 VAC		100 VAC	
	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
On-Idle (ENERGY STAR® Idle (S0))	50.9W		52.7W		51.0W	
ENERGY STAR® P_{TEC} (Total Energy Consumption) Windows running Linpack and Viewperf) (S0)	181.3W		176.2W		179.6W	
Windows Busy Max (S0)	200.1W		192.0W		196.7W	
ENERGY STAR® "Sleep" (S3)*	2.93W	2.06W	6.58W	2.36W	2.80W	2.04W
ENERGY STAR® "Standby" (Off) (S5)	1.69W	0.94W	2.00W	1.23W	1.67W	0.92W

Heat Dissipation**

	115 VAC		230 VAC		100 VAC	
	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
On-Idle (ENERGY STAR® Idle (S0))	173.6 btu/hr		179.7 btu/hr		174.0 btu/hr	
ENERGY STAR® P_{TEC} (Total Energy Consumption) Windows running Linpack and Viewperf) (S0)	618.6 btu/hr		601.2 btu/hr		612.8 btu/hr	
Windows Busy Max (S0)	682.9 btu/hr		655.3 btu/hr		671.3 btu/hr	
ENERGY STAR® "Sleep" (S3)*	10.0 btu/hr	7.03 btu/hr	12.2 btu/hr	8.05 btu/hr	9.56 btu/hr	6.96 btu/hr
ENERGY STAR® "Standby" (Off) (S5)	5.77 btu/hr	3.21 btu/hr	6.83 btu/hr	4.20 btu/hr	5.70 btu/hr	3.14 btu/hr

Example Configuration #2
(Energy Star 4.0 Compliant)

Processor Info	1x AMD Opteron 2.0GHz 1212
Memory Info	2x512MB DDR2-667MHz
Graphics Info	Integrated
Disks/Optical/Floppy	1x 80GB SATA / 1 Optical / 1 Floppy

Technical Specifications

Energy Consumption

	115 VAC		230 VAC		100 VAC	
	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
On-Idle (ENERGY STAR® Idle (S0))	38.8W		36.9W		39.1W	
ENERGY STAR® P_{TEC} (Total Energy Consumption) Windows running Linpack and Viewperf) (S0)	96.6W		94.5W		99.5W	
Windows Busy Max (S0)	112.3W		108.1W		115.3W	
ENERGY STAR® "Sleep" (S3)*	2.64W	1.78W	2.84W	2.10W	2.61W	1.79W
ENERGY STAR® "Standby" (Off) (S5)	1.75W	0.98W	2.00W	1.25W	1.75W	0.95W

Heat Dissipation**

	115 VAC		230 VAC		100 VAC	
	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
On-Idle (ENERGY STAR® Idle (S0))	132.4 btu/hr		125.9 btu/hr		133.5 btu/hr	
ENERGY STAR® P_{TEC} (Total Energy Consumption) Windows running Linpack and Viewperf) (S0)	329.6 btu/hr		322.6 btu/hr		339.7 btu/hr	
Windows Busy Max (S0)	383.3 btu/hr		369.0 btu/hr		393.5 btu/hr	
ENERGY STAR® "Sleep" (S3)*	9.01 btu/hr	6.08 btu/hr	9.69 btu/hr	7.17 btu/hr	8.91 btu/hr	6.11 btu/hr
ENERGY STAR® "Standby" (Off) (S5)	5.97 btu/hr	3.34 btu/hr	6.83 btu/hr	4.27 btu/hr	5.97 btu/hr	3.24 btu/hr

NOTES:
* Energy Star low energy mode
** Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (L_{Wad}, bels)	Sound Pressure (L_{Wad}, decibels)
System Fan Off		
Idle	TBD	TBD
Fixed Disk (random writes)	TBD	TBD

Longevity and Upgrading	This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 5 years after the end of production. Upgradeability features contained in the product include:

	• Single AM2 socket • 8 USB ports • 2 PCI slots and 2 PCI Express slots • 6 storage bays • 4 memory slots
Batteries	This product complies with ISO standards: • EU Directive 91/ 157/ EEC • EU Directive 93/ 86/ EEC • EU Directive 98/ 101/ EEC Batteries used in the product do not contain: • Mercury greater the 5ppm by weight • Cadmium greater than 10ppm by weight • Lead greater than 4000ppm by weight. Battery size: CR2032 (coin cell) Battery type: Lithium
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. • Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043. • This product contains 0% recycled materials (by wt.) • This product is >90% recycle-able when properly disposed of at end of life.

Packaging Materials		
External	Cardboard carton and insert	2.70 kg
Internal	LDPE Foam	0.35 kg

Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Diphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB)

	• Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tinches; TBT), Triphenyl Tinches; TPT), Tributyl Tin Oxide (TBTO)
Packaging	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
End-of-Life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: [link to new HP white paper now in progress] Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

Technical Specifications - Audio

Integrated Intel/Realtek HD ALC262 Audio	Type	Integrated
	High Definition Codec	Yes
	FM Synthesis Support	Yes
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Meets Premium performance for Windows Logo Program 3.0	Yes
	Audio Jacks	Front panel microphone in and headphone out – fixed usage. Rear panel line in and line out jacks – jacks are retaskable One Line-In* (12-K ohm Input Impedance)* NOTE: External Speakers need to be powered externally.
	Sampling	3 stereo ADCs support 16/20-bit PCM format with 44.1K/48K/96kHz sample rate 2 stereo DAC supports 16/20/24-bit PCM format with 44.1K/48K/96K/192kHz sample rate
	Wavetable Syntheses (software)	Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support)
	3D Positional Sound	No
	Digital Audio	Yes
	Analog Audio	Yes
	DVD Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	Hardware Equalizer for Internal Speaker	No
	External Speaker Jack (Line-Out)	Yes
Sound Blaster X-Fi XtremeMusic (PCI)	Audio Quality	Total Harmonic Distortion + Noise at 1kHz (20kHz Low-pass filter) = 0.004%
	Signal to Noise Ratio (SNR)	Signal-to-Noise Ratio (20kHz Low-pass filter, A-Weighted) • Stereo Output: 109dB • Front and Rear Channels: 109dB • Center, Subwoofer and Side Channels: 109dB

Technical Specifications - Audio

Sound Conversion	24-bit Analog-to-Digital conversion of analog inputs at 96kHz sample rate 24-bit Digital-to-Analog conversion of digital sources at 96kHz to analog 7.1 speaker output 24-bit Digital-to-Analog conversion of stereo digital sources at 192kHz to stereo output	
Recording/Sampling Rate	44.1, 48 and 96kHz	
ASIO 2.0 support	16-bit/44.1kHz, 16-bit/48kHz, 24-bit/44.1kHz 24-bit/48kHz and 24-bit/96kHz with direct monitoring	
Enhanced SoundFont support	up to 24-bit resolution 24-bit/96kHz	
DACs	24-bit/192kHz	
Voice Support	128 voices	
Max. Channels in 3D Positional Audio	7.1	
EAX® ADVANCED HD™ 5.0 support	Yes including EAX® MacroFX™, EAX® PurePath™ and Environment FlexiFX™	
Connectors	FlexiJack (Performing a 3-in-1 function, Digital In / Line In / Microphone) via 3.50 mm minijack Line level out (Front / Rear / Center / Subwoofer / Rear Center) via 3.50 mm minijacks AUX_IN line-level analog input via 4-pin Molex connector on card One AD_Link (26 pin) connector for linking to the X-Fi I/O Console (upgrade option)	
Dimensions	7.25 x 5 x 0.9 inches; 18.415 x 12.7 x 2.286 cm	
Additional product features	Movies	THX Certification Dolby Digital EX 6.1 Playback DTS-ES 6.1 Playback
	Music	X-Fi 24-bit Crystalizer CMSS-3D SuperRip
	Audio Creation	Pristine audio playback quality with a near transparent SRC engine Up to eight 24-bit hardware effects ASIO recording with latency as low as one millisecond 24-bit SoundFont® sampling 3D MIDI
	Gaming	EAX ADVANCED HD 5.0
	Software Bundle	Doom 3 Sound Blaster EAX patch Entertainment Mode Audio Creation Mode Game Mode Mode Switcher Audio Console Creative MediaSource Creative MediaSource DVD-Audio Player DTS Neo:6 Settings

		Karaoke Player Entertainment Center Smart Recorder SoundFont Bank Manager Speaker Connection Wizard THX Setup Console Vienna SoundFont Studio Volume Panel WaveStudio Console Launcher Creative Media Toolbox Creative Diagnostics
Minimum system requirements	System RAM	256MB
	Hard disk	600MB free space Available PCI 2.1 slot for the audio card CD-ROM/CD-RW or CD/DVD-ROM required for software installation
	Operating System	Microsoft Windows XP Service Pack 2 (SP2)

Technical Specifications - Communications

Integrated PCI Express Broadcom BCM5755 NetXtreme Gigabit Ethernet Network Controller LoM	Connector	RJ-45
	Controller	Broadcom 5755 PCI-E LAN Controller
	Memory	Integrated 48KB receive buffer and 8KB transmit buffer
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCIe 1.0a
	Data path width	X1
	Data path speed	2.5Gbit per sec per direction transfer rate
	Data transfer mode	Bus-master DMA
	Power requirement	1.5 watts @ +3.3V AUX supply
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating system driver support	Microsoft Windows Vista Business 32 and 64, Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux WS 4 & 5 Desktop
	Management capabilities	WOL, PXE
	Alerting	ASF 2.0

Broadcom BCM5751 NetXtreme Gigabit Ethernet Controller (PCIe) (Part# EA833AA)	Connector	RJ-45
	Controller	Broadcom 5751 PCI-E 1.0a LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCIe 1.0a
	Data path width	X1
	Data path speed	2.5Gbit per sec per direction transfer rate
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC class B, NRTL Mark Canada and United States, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia
	Power requirement	3.1 watts @ +3.3V AUX supply
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, 1000 Mbps

Environmental	Operating temperature	32° to 131° F (0° to 55° C)
	Operating humidity	85% at 131° F (55° C)
Dimensions		4.4 x 2.2 x 0.08 inches; 11.2 x 5.5 x .2 cm
Operating system driver support		Microsoft Windows Vista Business 32 and 64, Microsoft Windows 2000 and XP, Red Hat Enterprise Linux WS 4 & 5 Desktop
Management capabilities		WOL, PXE , Remote cable management
Alerting		ASF 2.0
Kit contents		Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI NIC, drivers, quick install guide, product warranty statement

Agere Systems PCI International Softmodem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Operating System Support	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition
	OS Driver Support	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems SV92PL - Integrated PCI interface with 5-V tolerant buffers and CardBus support

Technical Specifications - Communications

Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 inches; 17.0 x 5.8 cm and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Health	Bare PCB material compliant to 94V-0 or better (marked as such)
Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant
Kit Contents	DC132D : Agere Systems PCI International Softmodem with full-height bracket attached, additional low-profile bracket, RJ11 modem cable, driver and documentation CD. NOTE: RJ11 modem adapter is not included. DC131C #xxx: RJ11 modem adapter kit for use with DC132D #ACP: Austria, #ABW: Belgium (Dutch/Flemish), #AKN: Bosnia, Herzegovna, Croatia, Slovenia, Yugoslavia (Slovenian), #AKB: Czech Republic (Czech) & Slovakia, #ABF: France, #ABD: Germany, #AB7:

SATA 3.0Gb/s hard drives 80 GB (7,200 rpm)	**Capacity**	80,026,361,856 bytes	
	Height	1 inches; 2.54 cm or less	
	Width	Media diameter: 3.5 inches; 8.89 cm Physical size: 4 inches; 10.2 cm	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.9 ms
		Average	9.3 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 131° F (5° to 55° C)	
160 GB (7,200 rpm)	**Capacity**	160,041,885,696 bytes	
	Height	1 inches; 2.54 cm or less	
	Width	Media diameter: 3.5 inches; 8.89 cm Physical size: 4 inches; 10.2 cm	
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.9 ms
		Average	9.3 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
250 GB (7,200 rpm)	**Capacity**	250,059,350,016 bytes	
	Height	1 inches; 2.54 cm or less	
	Width	Media diameter: 3.5 inches; 8.89 cm Physical size: 4 inches; 10.2 cm	
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	16 MB	

	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
		Average	11.0 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500 GB (7,200 rpm)	**Capacity**	500,107,862,016 bytes	
	Height	1 inches; 2.54 cm or less	
	Width	Media diameter: 3.5 inches; 8.89 cm	
		Physical size: 4 inches; 10.2 cm	
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Cache	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.3 ms
		Average	20.0 ms
		Full-Stroke	30 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	

USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 inches ; 45.8 x 16.3 x 2.5 cm
		Weight	2 lbs (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Operating system support	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux WS 4 & 5 Desktop	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
	Kit contents	Keyboard, keyboard software media, installation guide, warranty card, safety and comfort	

Technical Specifications - Peripherals

USB Smart Card Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 inches ; 45.8 x 16.3 x 2.5 cm
		Weight	2 lbs (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Operating system support	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux WS 4 & 5 Desktop	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
	Kit contents	Keyboard, keyboard software media, installation guide, warranty card, safety and comfort	
HP USB Smart Card Keyboard (ED707AA)	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country
		Form factor	USB basic Smart Card keyboard
		Colors	Carbonite/Silver
		Dimensions (L x W x H)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)

	Weight	2 lb (0.9 kg) minimum
Electrical	Operating voltage	+ 5VDC ± 5%
	Power consumption	100-mA maximum (with four LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI – RFI	Conforms to FCC rules for a Class B computing device
	MicrosoftPC 99 – 2001	Functionally compliant
Mechanical	Languages	30+ available
	Keycaps	Low-profile design
	Switch actuation	55-g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	Operating temperature	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
SMARTCARD function	Support	All ISO 7816 smart cards
	Interface	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)
	Chipset	SCM STCII
	Standard APIs supported	PC/SC, EMV2000, SET
	Power	USB Port
		Short circuit detection (protects smart card and reader)
		Power supply compliant with ISO7816 and EMV (5V, 60 mA)
		Supports 3-V and 5-V cards

	Power consumption	250-mA maximum draw (50 mA for the keyboard with three LEDs ON and 200-mA maximum startup current using a high-current, 60-mA smart card)	
	Communication	From card	Programmable from 9,600 baud to 115,200 baud
		From computer	Up to 38,400 baud
	Landing mechanism	Contact device	Friction contact
		Card insertions rating	Up to 100,000 insertion cycles
	Interface modes	USB communications through USB port	
		SCM protocol	
		Automatic card insertion/removal detection	
	Reader performance interface	USB connection	
	Electro-magnetic standards	Europe	89/336/CEE guideline
		USA	USAFCC part 15
Operating system support	Microsoft Windows XP Professional, Windows XP Professional x64 Edition, Microsoft Windows Vista Business 32 and 64		
Approvals	CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, JITC, EMV2000, USB-IF		
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, TUVGS		
Kit contents	Keyboard, I/O Security and Documentation CD, , warranty card		
Smart card compatibility	HP	HP ProtectTools Smart Card	
	American Express	Amex Blue	
	Axalto (Schlumberger)	Cryptoflex 8K Cryptoflex 16K Cryptoflex 32K Cryptoflex 32K e-gate Cyberflex Access 64K Cyberflex Access 32K Cyberflex 32K e-gate Cyberflex 64K Cyberflex Palmera Payflex-S Payflex 1K Payflex 2K Payflex 4K Payflex 8K Prismera US DoD CAC	
	Cardlogix	CLXSU004KK4 CLXSU008KK5	
	Safenet, Inc.	Model 300 Model 330	

De La Rue	VisaCash
Gemplus	Gem Expresso GKK32K Gemclub Memo GemClub Micro GemXplore GemSafe
Infineon	SLE66C322P
SafLink (Litronic)	Forte
Sharp	Java Card
Oberthur	CosmopolIIC v4 CosmopolIIC v4.1 Cosmo ID-One GalatIIC v2.1 US DoD CAC
Memory Cards	
Atmel	AT24C01ASC AT24C02SC AT24C04SC AT24C08SC AT24C16SC AT24C32SC AT24C64SC AT24C128SC AT24C256SC AT24C512SC AT88SC153 AT88SC1608
Axalto (Schlumberger)	PrimeFlex Store 8K PrimeFlex Store 2K
nfineon	SLE4406 SLE4406E SLE4406E SE SLE4418 SLE4428 SLE4432 SLE4436E SLE4442 SLE5536
ISSI	IS23SC4418 IS23SC4428
ST	14C02
Telefonkarte	SLE4406 SLE4436 SLE5536
XICOR	X24026

Technical Specifications - Peripherals

HP 2-button Optical Scroll Mouse (USB)	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 inches; 3.8 x 11.6 x 6.3 cm	
	Weight	0.27 lb (0.12 kg)	
	Cable length	72.8 inches; 185 cm	
	System requirements	Microsoft Windows XP, Red Hat Enterprise Linux WS 4 & 5 Desktop	
HP Optical 3-Button Mouse (USB)	Dimensions/Weight	Height	1.5 inches; 3.6 cm
		Length	4.5 inches; 11.56 cm
		Width	2.2 inches; 6.19 cm
		Weight	3.80 oz (108 g)
	Environmental	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating temperature	-4° to 140° F (-20° to 60° C)
		Operating humidity	10% to 90% (non condensing at ambient)
	Mechanical	Tracking speed	6 in/s Maximum
		Switch life	3,000,000 operations
		Switch type	Micro-switches
		Tracking mechanism life	155 miles (250 km) at average speed of 10 in/s
		Cable length	6 feet; 1.8 m
HP SpaceExplorer USB 3D Input Device	Physical Characteristics	Dimensions (L x W x H)	7.6 x 5.4 x 2.3 in (194 x 139 x 58mm)
		Weight	1.36 lbs (0.62 kg)
		Palmrest	Sculpted
	Mechanical	Buttons	15 reprogrammable speed keys
		Motion Controller	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)
		Device Sensitivity	Adjustable to preference
	Operating System Supported	Microsoft Windows Vista Business 32 and 64, Microsoft Windows XP Professional or XP x64	
	Regulatory Approvals	FCC, CE	

Technical Specifications - Peripherals

HP SpacePilot (USB – Windows XP Only)	Physical Characteristics	Dimensions (L x W x H)	9.3 x 5.6 x 2.0 inches; 236 x 143 x 53 mm
		Weight	1.875 lb (0.85 kg)
		Palmrest	Sculpted
	Mechanical	Buttons	21+ programmable speed keys 15 reprogrammable
		LCD Viewing Area (W x H)	4.0 x 1.0 inches; 102.4 x 30.2mm
		Active Area (W x H)	3.7 x 1.0 inches; 93.4 x 26.2mm
		Display Format	240 x 64
		Motion Controller	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)
		Device Sensitivity	Adjustable to preference
	System Requirements	USB 1.1 or 2.0	
	Operating System Supported	Microsoft Windows XP, not supported in Linux	
	Regulatory Approvals	FCC, CE	

HP 16X Max SATA DVD-ROM Drive	Form Factor	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 8X
		DVD-ROM	Up to 16X
		DVD-RAM	Up to 4X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Removable Storage - Media Compatibility - DVD-ROM		
	Media	Read	Write
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
	DVD+RW	Yes	No
	DVD-R	Yes	No
	DVD-RW	Yes	No
	DVD-R DL	Yes	No
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum

Technical Specifications - Optical Devices

	Environmental (all conditions non-condensing)	**Temperature** (operating)	41° to 122° F (5° to 50° C)
		Relative Humidity (operating)	10% to 90%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)
	Operating Systems Supported	Windows Vista Business 32 and 64*, Windows XP Professional or Red Hat Enterprise Linux WS 4 & 5 Desktop, No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit http://www.windowsvista.com/systemrequirements.	
	Option kit contents	HP 16X Max SATA DVD-ROM Drive, Intervideo WinDVD and installation guide.	
HP 16X Max SATA DVD+/-RW LightScribe Drive	**Form Factor**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speed	**DVD+R**	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		DVD-RAM	Up to 12X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	**DVD-RAM**	Up to 12X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access times (typical reads, including setting)	**Random**	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Power	**Source**	SATA DC power receptacle

	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum
	Total Drive Power (standby mode)	< 2.5 Watt
Environmental (all conditions non-condensing)	**Temperature** (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
Operating Systems Supported	Windows Vista Business 64* (64-bit expected availability in July 2007), Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*, Red Hat Linux WS 4 & 5 Desktop (32/64-bit OS). No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit http://www.windowsvista.com/systemrequirements.	
Option kit contents	HP 16X DVD+-RW SuperMulti LightScribe drive, LightScribe software, Roxio Easy Media Creator version 9, Intervideo WinDVD Software, installation guide, and DVD+R media. Software is Microsoft Windows only.	

Technical Specifications - Graphics

Integrated ATI Radeon X1250 graphics	3D/2D Controller	Full Microsoft DirectX® 9 based with Shader 2.0 support, full precision floating point pixel pipeline, 2x, 4x, or 6x Anti-Aliasing, hidden surface removal using 16, 24, or 32-bit Z-Buffering. Support for Microsoft's DirectDraw, Double Buffering, Virtual Sprites, Transparent Blit, and Masked Blit.
	VGA/DVI Controller	Integrated
	Bus Type	PCI Express™ x16 for optional graphics upgrade.
	RAMDAC	Integrated
	Memory	HYPERMEMORY™ technology offers optional dedicated Local Frame Buffer configuration for a 32-bit or 64-bit interface. UMA mode operation uses from 32MB up to 256MB of main memory configurable as display memory
	Controller Clock Speed	400 MHz
	Overlay Planes	Back end overlay supporting Motion Adaptive De-Interlacing
	Maximum Color Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	Supports resolutions up to 2048x1536 @ 32bpp.
	Multi-display Support	Up to 2 displays can be supported via the motherboard's VGA and DVI-D connectors. Integrated graphics is disabled when discreet PCI-Express graphics is installed in the x16 slot
	Operating Systems	Microsoft Windows XP Professional SP2 and Microsoft Windows Vista Business 32, Red Hat Enterprise Linux WS 4
	Graphics/Video API Support	Microsoft DirectX 9, DirectXVA®, VMR7, VMR9, GDI/GDI+

NVIDIA Quadro NVS 290, 256 MB Dual Head	Form Factor	Low Profile
	Bus Type	PCIe x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connector	DMS-59, includes DMS-59 to Dual DVI-I cable. DMS-59 to Dual VGA cable available as an option.
	Display resolution support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Color planes	32-bit color buffer
	Overlay planes	Hardware supported
	nView Architecture	Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows®.
	Multi-Monitor Support	Dual monitor support
	DVI Support	DMS-59 (to dual DVI-SL)
	High-definition Video	Full-screen, full-frame video playback of HDTV and DVD content

Technical Specifications - Graphics

	Processor (HDVP)	DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Supported Graphics APIs	OGL 2.1 & DX10 Support; Shader Model 4.0
	Available graphics drivers	Microsoft Windows Vista Business 32 and 64, Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode), Linux – Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html.
NVIDIA Quadro FX 370 PCI-Express graphics controller	**Form Factor**	ATX
	Bus Type	PCI-Express x16
	Memory	256MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (single-link)
	Display resolution support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Architecture Features	High Resolution Anti-Aliasing PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes H/W accelerrated pixel readback 3rd generation occlusion culling AA on scan-out
	Power consumption	<50 W
	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available graphics drivers	Microsoft Windows Vista 32 and 64, Microsoft Windows XP, Linux – Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.

NVIDIA Quadro FX 570 PCI-Express graphics controller	Form Factor	ATX
	Bus Type	PCI-Express x16
	Memory	256MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (single-link)
	Display resolution support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Architecture Features	High Resolution Anti-Aliasing PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes H/W accelerrated pixel readback 3rd generation occlusion culling AA on scan-out
	Power consumption	<60 W
	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available graphics drivers	Microsoft Windows Vista 32 and 64, Microsoft Windows XP, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.

Technical Specifications - Graphics

NVIDIA Quadro FX 1700 PCI-Express graphics controller	Form Factor	ATX
	Bus Type	PCI-Express x16
	Memory	512 MB 4000MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (single-link)
	Display resolution support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Architecture Features	High Resolution Anti-Aliasing PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes H/W accelerrated pixel readback 3rd generation occlusion culling AA on scan-out
	Power consumption	<75 W
	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available graphics drivers	Microsoft Windows Vista 32 and 64, Microsoft Windows XP, Linux – Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.

Technical Specifications - Graphics

ATI FireGL V5600 PCI-Express graphics controller	Form factor	ATX
	Graphics controller	R520
	Bus Type	PCI-Express x16
	Memory	512 MB f unified frame buffer, Z-buffer and Texture storage and a 128-bit Ring-Bus memory controller
	Connectors	Two dual-link DVI connectors with analog/digital outputs
	Maximum resolution	Dual Link digital support for 3840 x 2400 @ 60Hz. Ideal for 30-inch widescreen displays.
	RAMDAC	Dual 10-bit per channel 400MHz
	Ring Bus memory controller	• 512-bit internal ring bus for highly efficient memory reads • Programmable intelligent arbitration logic
	Display output	• Up to 16-bit per RGB color component High Dynamic Range output (HDR) • Programmable piecewise linear gamma correction, color correction, and color space conversion (10-bits per color)
	Shading architecture	• SupportsFull Shader Model 4.0 • 120 shader processing unit
	Supported graphics APIs	DirectX 10 and OpenGL 2.1 advanced
	Available graphics drivers	Microsoft Windows XP Professional qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. HP-tested Windows XP and Linux Microsoft Windows Vista 32 and 64, Microsoft Windows XP, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, CD and manual.

HP L1965 Flat Panel Monitor	Panel	Type	Active matrix, thin film transistor (TFT)
		Viewable Image Area (diagonal)	19 inches; 48.25 cm maximum viewable
		Screen Opening (WxH)	14.9 x 12.0 inches; 38.0 x 30.5 cm
		Viewing Angle (typical)	178 degrees horizontal/178 degrees vertical (10:1 minimum contrast ratio)
		Brightness (typical)	300 nits (cd/m2)
		Contrast Ratio (typical)	1000:1 (typical)
		Response Rate (typical)	6 ms (typical gray to gray)**
		Pixel Pitch	0.294 mm
		Backlight Lamp Life (to half brightness)	50K hours
		* NOTE: All performance specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.	
		**NOTE: 20 ms rise and fall	
	Video/Other Inputs	Plug and Play	Yes (supports VESA DDC2B and DDC/CI; PC2001 compliant)
		Self Powered USB 2.0 Hub	One upstream, four downstream ports (cable included)
		Input Signal	Two DVI-I connectors (VGA analog or digital)
		Input Impedance	75 ohms ± 2%
		Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green (activated through on-screen display)
		Video Cable	One DVI-D to DVI-D, and 1 DVI-I to VGA cables
		Video Cable Length	71 in (1.8 m)
	Signal Interface/ Performance	Horizontal Frequency	24 to 83 kHz
		Vertical Frequency	48 to 76 Hz
		Native Resolution	1280 x 1024 @ 75 Hz analog 1280 x 1024 @ 60 Hz digital
		Maximum Resolution (Analog)	1280 x 1024 @ 75 Hz analog
		Maximum Resolution (Digital)	1280 x 1024 @ 75 Hz analog
		Preset VESA Graphic Modes (non-interlaced)	640 x 480 @ 60 Hz, 72 Hz, 75 Hz 720 x 400 @ 70 Hz 800 x 600 @ 60 Hz, 72 Hz, 75 Hz 1024 x 768 @ 60 Hz, 70 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75 Hz
		Preset MAC Mode	832 x 624 @ 75 Hz 1152 x 870 @75 Hz
		Preset VGA Mode	640 x 480 @ 60 Hz, 72 Hz
		Preset SUN Mode	1152 x 900 @ 76 Hz

		Fail Safe Mode	Yes (limits out of range signal messages)	
		Maximum Pixel Clock Speed	140 MHz	
		User Programmable Modes	Yes, 15	
		Anti-Glare	Yes	
		Anti-Static	Yes	
		AssetControl	Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability)	
		Default Color Temperature	Yes (6500k, 9300k, SRGB, Custom User)	
	On Screen Display (OSD) Controls	Buttons or Switches	Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch	
		Languages	English, Spanish, French, German, Netherlands, Italian, Japanese, Simplified Chinese	
		User Controls	Size and Positioning Contrast Brightness Clock, Clock Phase Selectable Color Temperature Serial Number Mode Displayed Sleep Timer Input Selection Factory Reset	
Power		Power Supply	Auto-ranging, 90 to 265 VAC; internal power supply	
		Input Power	100 ~ 240 VAC	
		Nominal Current	1.5 A maximum	
		Frequency	50 ~ 60 Hz	
		Typical Power Consumption	< 35 watts	
		Maximum	< 55 watts	
		Power Saving	< 2 watts	
		Off Mode	0 watts (when master power switch is in the off position)	
		Power Cable Length	74.8 in (1.9 m); non-captive	
Mechanical		Dimensions (H x W x D)	Unpacked with stand	14.85 min to 18.79 max x 15.9 x 8.78 inches (37.72 min to 47.72 max x 40.39 x 22.29 cm)
			Base Area (Footprint D x W)	8.78 x 11.88 inches (22.29 x 30.18 cm)
			Panel only (without stand) (H x W x D)	12.96 x 15.9 x 2.4 inches (32.91 x 40.39 x 6.1 cm)

	Weight	Unpacked with stand	15.6 lbs (7.06 kg)
		Unpacked without stand	9.26 lbs (4.19 kg)
		Packaged	20.5 lbs (9.27 kg)
	Bezel Width	12.5 mm left and right, 12.75 mm top and bottom	
	Tilt Range	-4 degrees to +30 degrees	
	Swivel Range	± 45 degrees horizontal swivel	
	Height Adjustable	Yes (4 in/100mm adjustment range)	
	Pivot Rotation	Yes, 90 degrees	
	Base	Ships attached and is removable	
Environmental	Temperature – Operating	41° to 95° F (5° to 35° C)	
	Temperature – Non-operating	-4° to 140° F (-20° to 60° C)	
	Humidity – Operating	20% to 80%	
	Humidity – Non-operating	5% to 95%	
	Altitude – Operating	0 to 12,000 ft (0 to 3,658 m)	
	Altitude – Non-operating	0 to 40,000 ft (0 to 12,192 m)	
Environmental Data	Eco-Label Certifications and Declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • US Energy Star • CECP	

Energy Consumption (in accordance with US Energy Star test method)	AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz	AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz	AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation	35.7 watts	35.6 watts	35.1 watts
Sleep	1.08 watts	1.14watts	1.23 watts
Off	0.93 watts	0.94 watts	0.92 watts
Heat Dissipation*	100 VAC, 50 Hz	115 VAC, 60 Hz	230 VAC, 50 Hz
Normal Operation	121.7 BTU/hr	121.4 BTU/hr	119.7 BTU/hr
Sleep	3.68 BTU/hr	3.89 BTU/hr	4.19 BTU/hr
Off	3.17 BTU/hr	3.21 BTU/hr	3.14 BTU/hr

*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Longevity and Upgrading	Upgradeability features contained in the product include: One upstream and four downstream USB ports
Ergonomics	The monitor meets the ergonomic requirement of EN-ISO 13406-2 for flat panel displays.
Additional Information	This product is in compliance with the Restrictions of Hazardous Substances (RoHS) Directive, 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive, 2002/96/EC.

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

Display meets the requirement for low frequency electromagnetic fields per MPR-II, TCO, and prEN50279 A/B/C.

This product contains 100% recycled materials (by wt.)

This product is 100% recycleable when properly disposed of at end of life.

Packaging Materials

- Corrugated - 0.955 kg
- Plastic (other) - 0.055 kg
- Polystyrene - 0.24 kg

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances

		• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
	Packaging	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
	Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html
Options	HP Silver Flat Panel Speaker Bar	Powered directly by the monitor or PC, seamlessly attaches to the monitor's bezel to bring full multimedia support to select HP flat panel monitors. Features include dual speakers with full sound range and external jack for headphones. Sold separately, part number EE418AA. For more information, refer to the HP Flat Panel Speaker Bar QuickSpecs.
Other	Accessories Included	One DVI-D to DVI-D cable, one DVI-I to VGA cable, one USB cable, and CD-ROM with Pivot Pro software, HP Display Assistant software, and HP Display LiteSaver software.
	Software	Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or

		keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese. HP Display Assistant is a software utility that allows monitor adjustment, color calibration, and security/asset management using the Display Data Channel Command Interface (DDC/CI) protocol of the connected desktop PC. HP Display LiteSaver feature allows you to schedule Sleep mode at preset times to help protect the monitor against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor.
	User Guide Languages	English, Bahasa, B. Portuguese, French, LA Spanish, Korean, Simplified Chinese, Traditional Chinese, Japanese, Danish, Dutch, Finnish, German, Italian, Norwegian, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Warranty Languages	English
	Color	Carbonite, two-tone carbonite and silver (EMEA only)
	VESA Mounting	Yes (swing arm/wall mount not included); base must be removed for mounting options)
	VESA External Mounting	Yes (standard 4 hole pattern, 100 mm)
	Kensington Lock-ready	Yes
Certification and Compliance		Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MPR-II Compliant, PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 99 or 03 depending on region (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft® Windows® Certification
Compatibility		VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP LP1965 Flat Panel Monitor. Recommended for use with HP products.
Service and Warranty		Three years parts, labor, and on-site service. 24-hour, 90-day, toll-free technical support. Replacement options may include second business day on-site service, or next business day direct replacement, at HP's sole discretion. With direct replacement, HP will ship a replacement display product directly to you. Using the prepaid shipping labels provided, return your failed display to HP in the same packaging as the replacement. Certain restrictions and exclusions apply. For details see your product warranty or contact HP Customer Support.

HP Flat Panel Monitor LP2065	Panel	Type	20-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	20.1 in (51 cm)
		Screen Opening (W x H)	16.2 x 12.17 inches; 41.1 x 30.9 cm

	Viewing Angle (typical)*	Up to 178° horizontal/178° vertical (10:1 minimum contrast ratio)
	Brightness (typical*	Up to 300 nits (cd/m2)
	Contrast Ratio (typical)*	Up to 800:1
	Response Rate (typical)*	8 ms (gray to gray), 16 ms (rise + fall)
	Pixel Pitch	0.255 mm
	Backlight Lamp Life (to half brightness)	45K hours
On Screen Display (OSD) **Controls**	**Buttons or Switches**	Input select, auto adjust/OSD up, OSD down, OSD menu select, power
	Languages	English, French, German, Spanish, Italian, Dutch, and Japanese
	User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, input selection, image control (including scaling), and factory reset
Signal Interface/ Performance	**Horizontal Frequency**	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input for modes with pixel clock less than 157 MHz)
	Vertical Frequency	48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input for modes with pixel clock less than 157 MHz)
	Native Resolution	1600 x 1200 @ 60 Hz (recommended)
	Preset VESA Graphic Modes (non-interlaced)	1600 x 1200 @ 60 Hz, 75 Hz (VGA input) 1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 85 Hz 640 x 480 @ 60 Hz, 75 Hz, 85 Hz
	Text Mode	720 x 400 @ 70 Hz
	Mac Mode	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
	Sun Mode	1152 x 900 @ 66 Hz
	Maximum Pixel Clock Speed	202 MHz (VGA input); 162 MHz (DVI input)
	User Programmable Modes	Yes, 10
	Anti-Glare	Yes
	Anti-Static	Yes
	Default Color Temperature	6500 K
Video Input	**Plug and Play**	Yes

	Input Signal	Four connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, and one s-video	
	Self Powered USB 2.0 Hub	One upstream, four downstream ports (cable included)	
	Input Signal	Two DVI-I connectors (dual VGA analog or dual digital input possible)	
	Input Impedance	75 ohms ± 10%	
	Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green	
	Video Cable	Two VGA to DVI-I; two DVI-D to DVI-I	
	Video Cable Length	5.9 ft (1.8 m)	
Power	Input Power	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz	
	Frequency	47.5 to 63 Hz	
	Typical Power Consumption	55 watts (without USB ports); 70 watts (USB ports fully loaded)	
	Maximum	< 75 W	
	Power Saving	< 2 watts	
	Power Cable Length	5.9 ft (1.8 m)	
Mechanical	Dimensions (H x W x D)	Unpacked with stand	16.7 to 21.8 x 17.4 x 8.67 inches; 42.5 to 55.5 x 44.3 x 22.0 cm
		Unpacked w/o stand (head only)	13.58 x 17.4 x 3.42 inches; 34.5 x 44.3 x 8.7 cm
		Packaged	11.77 x 22.2 x 16.77 inches; 29.9 x 56.4 x 42.6 cm
	Weight	Unpacked	With stand: 20.28 lb (9.2 kg); Without stand: 12.35 lb (5.6 kg)
		Packaged	26.3 lb (11.95 kg)
	Tilt Range	-5° to + 25° vertical tilt	
	Swivel Range	-45° to + 45°	
	Height Adjustable	Yes, range 5.1 in (13.0 cm)	
	Pivot Rotation	Yes	
	Base	Detachable, ships attached	
Environmental	Temperature – Operating	46° to 95° F (10° to 35° C)	
	Temperature – Non-operating	6° to 140° F (-10° to 60° C)	
	Humidity – Operating	20% to 80% non-condensing	

	Humidity – Non-operating	5% to 85%
	Altitude – Operating	+12,000 ft (+3,657.6 m)
	Altitude – Non-operating	+40,000 ft (+12,192 m)
Options	HP Silver Flat Panel Speaker Bar - Part number: EE418AA	Powered directly by the monitor or the PC, the Speaker Bar seamlessly attaches to the monitor's lower bezel to bring full audio support to select HP flat panel monitors. Features include dual speakers with full sound range and external jack for headphones. Sold separately. For more information, refer to the HP Silver Flat Panel Speaker Bar QuickSpec.
Other	Accessories Included	VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #1 or 2 (DVI-I analog) connector. DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #1 or #2 (DVI-I digital) connector.
	User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Software	HP Display Assistant Utility makes it possible to adjust displays settings through the PC using two-way communication via DDCI. HP Display Lite Saver allows ability to power up and down display at predetermined hours of the day to safe power and backlight life. Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese.
	User Guide Languages	English
	Warranty Languages	English
	Color	Carbonite/Silver
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
	Kensington Lock-Ready	Yes
Certification and Compliance		Canadian Requirements/CSA, CE Marking, CISPR Requirements, Energy FCC Approval, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval,, MPR-II Compliant, PC2001 Compliant, PC99 Certified, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft Windows Certification (Microsoft Windows XP)

	Compatibility	Compatible with platforms using the VESA standard video modes. Recommended for use with HP products.
	Service and Warranty	Three years parts, labor, and on-site service. 24-hour 365-day 1-800 technical support. Replacement options include 2nd business day on-site service or next business day direct replacement. With direct replacement, HP will ship a replacement display product directly to you. Using the shipping labels provided, return your failed display to HP. Certain restrictions and exclusions apply. For details, contact HP Customer Support.

HP Flat Panel Monitor LP2465	**Panel**	**Type**	24-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	24 inches; 60.96 cm
		Screen Opening (W x H)	20.47 x 12.83 inches; 52.0 x 32.6 cm
		Viewing Angle (typical)*	178° H/ 178° V (10:1 minimum contrast ratio)
		Brightness (typical)*	500 nits (cd/m^2)
		Contrast Ratio (typical)*	1000:1
		Response Rate (typical)*	8 ms (typical gray to gray)
		Pixel Pitch	0.270 mm
		Backlight Lamp Life (to half brightness)	50K hours
		*Response time 13 ms rise and fall, 6 ms gray to gray.	
	On Screen Display (OSD) Controls	**Buttons or Switches**	Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power
		Languages	English, French, German, Spanish, Italian, Japanese, Dutch
		User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
	Signal Interface/ Performance	**Horizontal Frequency**	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
		Vertical Frequency	48 to 85 Hz (VGA and DVI input)
		Native Resolution	1920 x 1200 @ 60 Hz (recommended) (native aspect ratio of 16:10)
		Preset VESA Graphic Modes (non-interlaced)	1920 x 1200 @ 60 Hz 1600 x 1200 @ 60 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 75 Hz 640 x 480 @ 60 Hz, 75 Hz

	Text Mode	720 x 400 @ 70 Hz	
	Mac Mode	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz	
	Sun Mode	1152 x 900 @ 66 Hz	
	Maximum Pixel Clock Speed	202 MHz (VGA input); 162 MHz (DVI input)	
	User Programmable Modes	Yes, 20	
	Anti-Glare	Yes	
	Anti-Static	Yes	
	Default Color Temperature	6500 K	
Video/Other Inputs	Plug and Play	Yes	
	Self Powered USB 2.0 Hub	One upstream, four downstream ports (located on side of monitor, cable included)	
	Input Signal	Two DVI-I (VGA analog and digital) inputs	
	Input Impedance	75 ohms ± 10%	
	Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green	
	Video Cable	VGA to DVI-I; DVI-D to DVI-D	
	Video Cable Length	5.9 ft (1.8 m)	
Power	Input Power	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz	
	Frequency	47.5 to 63 Hz	
	Typical Power Consumption	75 watts	
	Maximum	< 110 watts	
	Power Saving	< 2 watts	
	Power Cable Length	6.2 ft (1.9 m)	
Mechanical	Dimensions (H x W x D)	Unpacked w/ stand	14.6 (min) to 19.7 (max) x 22 x 9.1 in (37.1 (min) to 50.1 (max) x 55.4 x 23.2 cm)
		Unpacked w/o stand (head only)	14.4 x 22 x 3.7 in (36.6 x 55.84 x 9.2 cm)
		Packaged	11.7 x 22.1 x 25.6 in (29.8 x 56.0 x 65.1 cm)
	Weight	Unpacked	23.6 lbs (10.7 kg)
		Packaged	23.6 lbs (10.7 kg)
	Tilt Range	-5° to + 25° vertical	
	Swivel Range	-45° to + 45°	
	Height Adjustable	Yes, range 5.1 in (130 mm)	
	Pivot Rotation	Yes	
	Base	Detachable, ships detached	

Environmental	Temperature – Operating	46° to 95° F (10° to 35° C)
	Temperature – Non-operating	6° to 140° F (-10° to 60° C)
	Humidity – Operating	20% to 80% non-condensing
	Humidity – Non-operating	5% to 85%
	Altitude – Operating	+12,000 ft (+3,657.6 m)
	Altitude – Non-operating	+40,000 ft (+12,192 m)
Other	Accessories Included	VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-D cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
	Software	Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese. HP Display Assistant is a software utility that allows monitor adjustment, color calibration, and security/asset management using the Display Data Channel Command Interface (DDC/CI) protocol of the connected desktop PC. HP Display LiteSaver feature allows you to schedule Sleep mode at preset times to help protect the monitor against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor.
	User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	Color	Carbonite/silver
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
	Kensington Lock-Ready	Yes
Options	HP Silver Flat Panel	Powered directly by the monitor or PC, the

		Speaker Bar - Part number: EE418AA	Speaker Bar seamlessly attaches to the monitor's lower bezel to bring full audio support to select HP flat panel monitors. Features include dual speakers with full sound range and an external jack for headphones. Sold separately. For more information, refer to the HP Flat Panel Speaker Bar QuickSpec.
	Certification and Compliance		Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft Windows Certification (Microsoft Windows 98, Microsoft Windows 2000, and Microsoft Windows XP)
	Compatibility		Compatible with platforms using the VESA standard video modes. Recommended for use with HP products.
	Service and Warranty		Three years parts, labor, and on-site service. 24-hour, 90-day, toll-free technical support. Replacement options may include second business day on-site service, or next business day direct replacement, at HP's sole discretion. With direct replacement, HP will ship a replacement display product directly to you. Using the prepaid shipping labels provided, return your failed display to HP in the same packaging as the replacement. Certain restrictions and exclusions apply. For details see your product warranty or contact HP Customer Support.
HP LP3065 Flat Panel Monitor	Panel	Type	30.0-inch Wide Format Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	29.77 in (75.623 cm)
		Screen Opening (W x H)	25.3 x 15.8 in (64.3 x 40.3 cm)
		Viewing Angle (typical)*	Up to 178° H/ 178° V (10:1 minimum contrast ratio)
		Brightness (typical)*	300 nits (cd/m2)
		Contrast Ratio (typical)*	1000:1
		Response Rate (typical)*	12 ms (8 ms average gray to gray)
		Pixel Pitch	0.250 mm
		Backlight Lamp Life (to half brightness)	40K hours
		Color Gamut	92% of NTSC
	On Screen Display (OSD) Controls	Buttons or Switches	Input select, brightness up, brightness down, power
		User Controls	Brightness, input selection
	Signal Interface/	Horizontal Frequency	100 KHz

Technical Specifications - Monitors

Performance	Vertical Frequency	60 Hz	
	Native Resolution	2560 x 1600 @ 60 Hz (native aspect ratio of 16:10)	
	Pixel Clock Speed	275 MHz	
	Anti-Glare	Yes	
	Anti-Static	Yes	
	Default Color Temperature	6500 K	
Video/Other Inputs	Plug and Play	Yes	
	Self Powered USB 2.0 Hub	One upstream, four downstream ports (located on side of monitor, cable included)	
	Input Signal	Three dual-link DVI-D inputs (Windows PC and graphics card that supports DVI ports with dual-link digital bandwidth and VESA DDC standard for plug-and-play setup requires a DVI-D dual-link graphic card that supports WQXGA (2560 x 1600) resolution.)	
	Video Cable	Two dual-link DVI cables	
	Video Cable Length	5.9 ft (1.8 m)	
Power	Input Power	Auto-Ranging, 100 to 240 VAC; internal power supply, 50 Hz/60 Hz	
	Typical Power Consumption	118 watts	
	Maximum	< 176 watts	
	Power Saving	< 2 watts	
	Power Cable Length	5.9 ft (1.8 m)	
Mechanical	Dimensions (H x W x D)	Unpacked w/ stand	19.3 to 23.2 x 27.2 x 9.5in (49.0 to 59.0 x 69.2 x 24.0 cm)
		Unpacked w/o stand (head only)	17.9 x 27.2 x 3.3 in (45.5 x 69.2 x 8.4 cm)
		Packaged	22.4 x 31.1 x 14.9 in (56.8 x 79.0 x 37.8 cm)
	Weight	Unpacked	30.6 lbs (13.9 kg)
	Tilt Range	-5° to + 30° vertical	
	Swivel Range	-45° to + 45°	
	Height Adjustable	Yes, range 5.1 in (100 mm)	
	Pivot Rotation	No	
	Base	Detachable, ships detached	
Environmental	Temperature – Operating	46° to 95° F (10° to 35° C)	
	Temperature – Non-operating	6° to 140° F (-10° to 60° C)	

	Humidity – Operating	20% to 80% non-condensing
	Humidity – Non-operating	5% to 85%
	Altitude – Operating	+12,000 ft
	Altitude – Non-operating	+40,000 ft

Environmental Data

Eco-Label Certifications and Declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Federal Energy Management Program (FEMP)
- IT Eco Declaration
- TCO 03
- Taiwan Green Mark
- CECP
- Korea Eco-label
- EPEAT - Silver

Energy Consumption (in accordance with US Energy Star test method)

	AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz	AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz	AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation	102.8 watts	101.7 watts	100.4watts
Sleep[1]	2 watts	2 watts	2 watts
Off	0.05 watts	0.06 watts	0.25 watts

Heat Dissipation[2]

	AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz	AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz	AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation	350.8 BTU/hr	347.0 BTU/hr	342.6 BTU/hr
Sleep	6.8 BTU/hr	6.8 BTU/hr	6.8 BTU/hr
Off	0.2 BTU/hr	0.2 BTU/hr	0.9 BTU/hr

NOTES

[1]This sleep status ignore the input sync signal check cycle when metering the model in sleep mode.

[2]Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Longevity and Upgrading

Upgradeability features contained in the product include:
One upstream and four downstream USB ports

Ergonomics

The monitor meets the ergonomic requirement of EN-ISO 13406-2 for flat panel displays.

Additional Information

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) Directive, 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive, 2002/96/EC.

This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).

This product is in compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see www.epeat.net.

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

Display meets the requirement for low frequency electromagnetic fields per MPR-II, TCO, and prEN50279 A/B/C.

This product contains 0% recycled materials (by wt.)

This product is 97.6% recycleable when properly disposed of at end of life.

Packaging Materials

- Corrugated Paper 2.19 kg
- PE-LD Bags 0.09 kg
- EPS Molded Foam 1.07 kg

RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics

- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

Hewlett-Packard

For more information about HP's commitment to the

	Corporate Environmental Information	environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html
Other	Accessories Included	Two dual link DVI-D to DVI-D cables - connects the graphic card's DVI-D digital connector to the monitor's input (DVI-D digital) connectors; power cord
	Software	HP Display LiteSaver feature allows you to schedule Sleep mode at preset times to help protect the monitor against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor.
	User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	Color	Carbonite
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
	Kensington Lock-Ready	Yes
Options	HP Flat Panel Speaker Bar - Part number: EE418AA	Powered directly by the monitor or PC, the Speaker Bar seamlessly attaches to the monitor's lower bezel to bring full audio support to select HP flat panel monitors. Features include dual speakers with full sound range and an external jack for headphones. Sold separately. For more information, refer to the HP Flat Panel Speaker Bar QuickSpec.
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Compatibility		Compatible with platforms using the VESA standard video modes. Recommended for use with HP products.
Service and Warranty		Three years parts, labor, and on-site service. 24-hour, 90-day, toll-free

technical support. Replacement options may include second business day on-site service, or next business day direct replacement, at HP's sole discretion. With direct replacement, HP will ship a replacement display product directly to you. Using the prepaid shipping labels provided, return your failed display to HP in the same packaging as the replacement. Certain restrictions and exclusions apply. For details see your product warranty or contact HP Customer Support.

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[i] Support for all peripherals and parts on Microsoft Windows Vista Business 64 is subject to the expected availability of Microsoft Vista Business 64 in CQ1 2008

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Warranty - year(s) Protected by HP Services, including a 3 years parts, 3 years labor, and 3 years onsite service (3/3/3) standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.